

Appl. No. 10/715,791
Amdt. Dated June 16, 2008
Reply to Final Office Action of April 16, 2008

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REMARKS/ARGUMENTS

Claims 1-32 are pending in the present application.

This Amendment is in response to the Final Office Action mailed April 16, 2008. In the Final Office Action, the Examiner rejected claims 8, 20, and 30 under 35 U.S.C. §112, second paragraph; claims 1-7, 9-19, 21-29, 31-32 under 35 U.S.C. §103(a). Applicant has amended claims 8, 12, 20, and 30. Applicant submits that the claim amendments introduce no new matter. Support for the amendments may be found in claim 1 and original claim 8, and in paragraphs [0030], [0032], [0035], [0044]-[0045], [0047]-[0048]. Reconsideration in light of the amendments and remarks made herein is respectfully requested.

Rejection Under 35 U.S.C. § 112

In the Final Office Action, the Examiner rejected claims 8, 20, and 30 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In response, Applicant has amended claims 8, 20, and 30.

Therefore, Applicant respectfully requests the rejection under 35 U.S.C. §112 be withdrawn.

Rejection Under 35 U.S.C. § 103

In the Final Office Action, the Examiner rejected claims 1-7, 9-19, 21-29, and 31-32 under 35 U.S.C. §103(a) as being unpatentable over Bhagat; and claims 8, 20, and 30 under 35 U.S.C. §103(a) as being unpatentable over Bhagat in view of U.S. Patent No. 5,600,822 issued to Grice ("Grice"). Applicant respectfully traverses the rejection and submits that the Examiner has not met the burden of establishing a prima facie case of obviousness.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *MPEP §2143, p. 2100-126 to 2100-130 (8th Ed., Rev. 5, August 2006)*. Applicant

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respectfully submits that there is no suggestion or motivation to combine their teachings, and thus no *prima facie* case of obviousness has been established.

Furthermore, the Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), stated: "Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined." MPEP 2141. In *KSR International Co. vs. Teleflex, Inc.*, 127 S.Ct. 1727 (2007) (Kennedy, J.), the Court explained that "[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." The Court further required that an explicit analysis for this reason must be made. "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR* 127 S.Ct. at 1741, quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). In the instant case, Applicant respectfully submits that there are significant differences between the cited references and the claimed invention and there is no apparent reason to combine the known elements in the manner as claimed, and thus no *prima facie* case of obviousness has been established.

1. Claims 1-7, 9-19, 21-29, and 31-32:

Bhagat discloses a method for managing user and server applications in a multiprocessor computer system. Within the user collection i, processes are grouped together into one or more sessions (Bhagat, col. 7, lines 16-17). The user collection may be allocated a variable number of CPU's, with the number of CPU's allocated to the user collection varied over time responsive to the needs of other collections in the computer (Bhagat, col. 7, lines 23-26).

Bhagat does not disclose, either expressly or inherently, suggest, or render obvious, at least one of: (1) assigning the first set of computer-readable instructions to at least one of said plurality of processors using an affinity mask; and (2) automatically adjusting the number of

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processors assigned to said first set of instructions by adding or removing a processor to or from the affinity mask based on processor usage in the system, the processor being removed from the affinity mask in a reverse order that the processor is added to the affinity mask.

First, Bhagat merely discloses grouping processes together into one or more sessions (Bhagat, col. 7, lines 16-17), not assigning the first set of computer-readable instructions to at least one of said plurality of processors using an affinity mask. A process is placed in a user collection if it is created by the same user or placed in a new user collection if it is created by a new user (Bhagat, col. 10, lines 30-41). Therefore, the grouping is based on the user, and not performed using an affinity mask.

In the Final Office Action, the Examiner contends that Bhagat's collection corresponds to affinity mask (Final Office Action, page 6, paragraph 21.i). However, the claim does not merely recite an affinity mask. The claim recites "assigning the first set of computer-readable instructions to at least one of said plurality of processors using an affinity mask." The assignment of the first set of computer-readable instructions uses an affinity mask, not the collection of the processors.

The Examiner further contends that Bhagat specifically teaches using affinity mask (Final Office Action, page 6, paragraph 21.i). However, Bhagat merely discloses that information for each process may be stored using a bit mask such as a processor affinity mask, with each bit in the mask used to indicate whether a CPU corresponding to such a bit is available for the specified process (Bhagat, col. 10, lines 45-49). Again, the claim does not merely recite an affinity mask, but rather the assignment of the first set of computer-readable instructions to at least one of said plurality of processors using an affinity mask. In fact, the fact that Bhagat was aware of the affinity mask but did not disclose the claimed invention indicates that it was not obvious to one skilled in the art to use the affinity mask in the manner as claimed.

Second, Bhagat merely discloses the number of CPU's allocated to the user collection varied over time responsive to the needs of other collections in the computer (Bhagat, col. 7, lines 23-26), not the processor being removed from the affinity mask in a reverse order that the processor is added to the affinity mask. The CPUs are merely allocated based upon usage patterns in a computer due to the creation and deletion of processes (Bhagat, col. 7, lines 38-41).

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This allocation does not remove a processor in a reverse order that it is added to the affinity mask.

Third, a Last-In-First-Out (LIFO) is a stack, a data structure. It is not an algorithm. It may be used in an algorithm like any other data structures, such as a First-In-First-Out (FIFO), or a queue, or a linked list. All of these data structures are well known. However, the claim does not recite a LIFO. Therefore, the Examiner's rejection is erroneous.

Fourth, the Examiner contends that since the LIFO is well known, it would have been obvious to one having ordinary skill in the art at the time of the invention to manage the processor group such that a processor is removed from the affinity mask in a reverse order that the processor was added to the affinity mask (Final Office Action, pages 3-4, paragraph number 5). This argument is flawed because there is no connection between a data structure LIFO and the order of removal of the processor from the affinity mask.

In the Final Office Action, the Examiner contends that normalization is well known and commonly practiced and even Applicant admitted that normalization is well known (Final Office Action, page 8, paragraph 21.ii). Applicant believes that the Examiner commits a logical fallacy of oversimplification. It is true that normalization is well known, but the rejected claim 5 does not recite normalization by itself. The rejected claim 5 recites "the CPU utilization is normalized for the CPUs in the number of processors eligible to execute the first set of instructions." There are other elements associated with "normalization". They are: (i) the CPU utilization, (ii) for the CPUs in the number of processors, and (iii) eligible to execute the first set of instructions. The Examiner has not shown that the prior art reference combined with any other reference, or by inherency, discloses these elements.

The Examiner further contends that since the threshold is desired, it may take on any value. However, as argued above, the rejected claims do not recite an arbitrary threshold value alone. The rejected claims 11 and 12 recite "the threshold value for adding a processor" and "the threshold value for deleting a processor", respectively. The Examiner has not shown that the prior art reference discloses or suggests these aspects of the claimed invention.

The Examiner rejected these claims by merely asserting that it would have been obvious to one having ordinary skill in the art to normalize the CPU utilization (Final Office Action, page 5, paragraph number 9) or to pick any percentage number (Final Office Action, page 6,

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paragraph numbers 14 and 15) without providing any technical reasoning. Apparently, the Examiner relies on the theory of inherency. However, Applicant submits that the Examiner's reliance of the theory of inherency is improper.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). Here, the Examiner has not provided a basis in fact and/or technical reasoning to support the normalization of the CPU utilization or the use of the 85% or 65% threshold values necessarily flows from the teachings of Bhagat.

2. Claims 8, 20, and 30:

Bhagat discloses a method for managing user and server applications in a multiprocessor computer system as discussed above.

Grice discloses a resource allocation synchronization in a parallel processing system. At predefined time intervals, each user application executing in a parallel processing system is given a higher priority such that the system resources are allocated to the user applications instead of the operating system services (Grice, Abstract, lines 2-6).

Bhagat and Grice, taken alone or in any combination, do not disclose or render obvious, at least one of: (1) assigning the first set of computer-readable instructions to at least one of said plurality of processors using an affinity mask; (2) automatically adjusting the number of processors assigned to said first set of instructions by adding or removing a processor to or from the affinity mask based on processor usage in the system, the processor being removed from the

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affinity mask in a reverse order that the processor is added to the affinity mask; and (3) first set of computer readable instructions are elevated in priority class before automatically adjusting the number of processors, as recited in amended claims 8, 20, and 30.

As discussed above, Bhagat does not disclose or render obvious elements (1) and (2) as above. Accordingly, a combination of Bhagat with any other references in rejecting claims 8, 20, and 30, which depend on claims 1, 13, and 23, respectively, is improper.

Furthermore, Grice merely discloses giving each user application a higher priority such that the system resources are allocated to the user applications instead of the operating system services (Grice, Abstract, lines 2-6), not elevating the first set of computer readable instructions in priority class before estimating processor usage. The raising of the priority is performed at pre-defined time intervals (Grice, col. 4, lines 52-58). Since it is performed at a predefined time interval, it is not performed before automatically adjusting the number of processors.

The Examiner failed to establish a prima facie case of obviousness and failed to show there is teaching, suggestion, or motivation to combine the references. When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to: (A) The claimed invention must be considered as a whole; (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and (D) Reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986). "When determining the patentability of a claimed invention which combined two known elements, 'the question is whether there is something in the prior art as a whole suggest the desirability, and thus the obviousness, of making the combination.'" *In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992), 24 USPQ2d 1040; *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ (BNA) 481, 488 (Fed. Cir. 1984). To defeat patentability based on obviousness, the suggestion to make the new product having the claimed characteristics must come from the prior art, not from the hindsight knowledge of the invention. *Interconnect Planning Corp. v. Feil*, 744 F.2d 1132, 1143, 227 USPQ (BNA) 543, 551 (Fed. Cir. 1985). To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the Examiner to show a motivation to combine

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the references that create the case of obviousness. In other words, the Examiner must show reasons that a skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the prior elements from the cited prior references for combination in the manner claimed. *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1996), 47 USPQ 2d (BNA) 1453. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or implicitly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973. (Bd.Pat.App.&Inter. 1985). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Furthermore, although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *In re Mills*, 916 F.2d at 682, 16 USPQ2d at 1432; *In re Fritch*, 972 F.2d 1260 (Fed. Cir. 1992), 23 USPQ2d 1780.

Moreover, the Examiner failed to establish the factual inquiries in the three-pronged test as required by the *Graham* factual inquiries. There are significant differences between the cited references and the claimed invention as discussed above. Furthermore, the Examiner has not made an explicit analysis on the apparent reason to combine the known elements in the fashion in the claimed invention. Accordingly, there is no apparent reason to combine the teachings of Bhagat and Grice.

In the present invention, the cited references do not expressly or implicitly disclose any of the above elements. In addition, the Examiner failed to present a convincing line of reasoning as to why a combination of Bhagat and Grice is an obvious application of dynamic resource management system for multiprocessor systems, or an explicit analysis on the apparent reason to combine Bhagat and Grice in the manner as claimed.

Therefore, Applicant believes that independent claims 1, 13, and 23 and their respective dependent claims are distinguishable over the cited prior art references. Accordingly, Applicant respectfully requests the rejection under 35 U.S.C. §103(a) be withdrawn.

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Conclusion

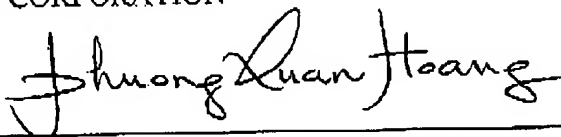
Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

UNISYS CORPORATION

Dated: June 16, 2008

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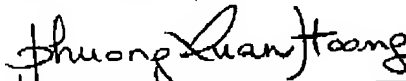
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